

Exhibit E

1 UNITED STATES DISTRICT COURT
2 CENTRAL DISTRICT OF CALIFORNIA
3 ENTROPIC COMMUNICATIONS,)
4 LLC,)
5)Case No.
6 Plaintiff,)2:23-cv-01049-JWH-KES
7) (Lead Case)
8 v.)
9)
10 COX COMMUNICATIONS, INC., et)Case No.
11 al.,)2:23-cv-01050-JWH-KES
12) (Related Case.)
13 Defendants.)
14 -----)
15 ENTROPIC COMMUNICATIONS,)
16 LLC,)
17)
18 Plaintiff,)
19)
20 v.)
21)
22 COMCAST CORPORATION, et al.,)
23)
24 Defendants.)
25 -----)

18 REMOTE PROCEEDINGS OF THE
19 VIDEOTAPED DEPOSITION OF JOHN HOLOBINKO
20 THURSDAY, MAY 9, 2024
21
22
23 REPORTED BY NANCY J. MARTIN
24 CSR. NO. 9504, RMR, RPR
25 PAGES 1 - 82

<p>1 UNITED STATES DISTRICT COURT 2 CENTRAL DISTRICT OF CALIFORNIA 3 ENTROPIC COMMUNICATIONS,) 4 LLC,) 5)Case No. 6 Plaintiff,)2:23-cv-01049-JWH-KES 7)Lead Case) 8 v.) 9) 10 COX COMMUNICATIONS, INC., et)Case No. 11 al.,)2:23-cv-01050-JWH-KES 12)Related Case.) 13 Defendants.) 14 -----) 15 ENTROPIC COMMUNICATIONS,) 16 LLC,) 17) 18 Plaintiff,) 19) 20 v.) 21) 22 COMCAST CORPORATION, et al.,) 23) 24 Defendants.) 25 -----) 26 --- 27 Thursday, May 9, 2024 28 --- 29 Remote Deposition of JOHN HOLOBINKO, 30 beginning at 8:43 a.m., before Nancy J. Martin, a 31 Registered Merit Reporter, Certified Shorthand 32 Reporter. All parties appeared remotely. 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 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1 CHARLOTTE, NORTH CAROLINA, THURSDAY, MAY 09, 2024;
2 8:43 A.M.
3 -OoO-
4 JOHN HOLOBINKO,
5 having been sworn/affirmed,
6 was examined and testified as follows:
7
8 EXAMINATION
9 BY MR. PADMANABHAN:
10 Q. Mr. Holobinko, we met briefly off camera,
11 but my name is Krishnan Padmanabhan. I'm an attorney
12 for Comcast, and I'll be asking you questions today.
13 Do you understand that?
14 A. Yes.
15 Q. And your job is to do your best to answer my
16 questions; correct?
17 A. Yes.
18 Q. Okay. You issued two declarations on the
19 matter of claim construction in this case; right?
20 A. Yes.
21 Q. And the first declaration was on April 19;
22 correct?
23 (The witness reviewed material.)
24 BY MR. PADMANABHAN:
25 Q. Dates don't matter, Mr. Holobinko. Let's

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1 just --
2 A. Yes.
3 Q. You issued an initial declaration; correct?
4 A. Yes.
5 Q. And about 10 days later you issued a rebuttal
6 declaration; correct?
7 A. Correct.
8 Q. And in those declarations you addressed two
9 claim terms; correct?
10 A. Yes.
11 Q. And one of those claim terms was "SNR-related
12 metric"?
13 A. Yes.
14 Q. And the other was "CMTS"?
15 A. Yes.
16 Q. Okay. So I'd like to start with SNR related
17 metric. Is that okay?
18 A. Sure.
19 Q. Both claims terms were in the claims of the
20 '682 patent; right?
21 A. Right.
22 MR. PADMANABHAN: Just one second.
23 (Pause in proceedings.)
24 MR. PADMANABHAN: So I've introduced what's
25 Exhibit 1 to your deposition, which are the exhibits

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1 that you had attached to your first declaration,
2 Exhibits A through K.
3 Let me know if you see them. They are also
4 found in your binder behind Tab 3.
5 (Deposition Exhibit 1 was marked for
6 identification.)
7 MR. GALLUZZO: KP, this is just a
8 housekeeping matter. Are you talking about
9 introducing on Exhibit Share because I don't see
10 anything?
11 MR. PADMANABHAN: I am introducing on Exhibit
12 Share. It seems to be spinning furiously.
13 Can we go off the record for just one second?
14 (A recess was taken from 8:46 a.m.
15 to 8:57 a.m.)
16 BY MR. PADMANABHAN:
17 Q. Mr. Holobinko, as Exhibit 1 to your
18 deposition, we've introduced Exhibits A to K for your
19 first declaration, and that's behind Tab 3 in your
20 binder. Can you turn there.
21 And if you go a few pages in, so Exhibit B to
22 your first declaration was the '682 patent.
23 A. Yes.
24 Q. And I'd like to go to Column 3 at Line 54.
25 Tell me when you're there.

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1 A. Yes, I'm there.
2 Q. At Line 54 it reads, "As shown in Figure 2A,
3 to determine one or more measured performance
4 metric(s) (e.g., an SNR-related metric such as SNR at
5 a particular frequency or SNR over a range of
6 frequencies (an SNR profile), noise levels, strength
7 of desired signals and/or the like)."
8 Do you see that?
9 A. Yes.
10 Q. So this passage recites something called a
11 "performance metric."
12 Do you see that?
13 A. Yes.
14 Q. And it also recites something called an
15 SNR-related metric.
16 A. Yes.
17 Q. Would you agree that the scope of performance
18 metric is broader than the scope of SNR related
19 metric?
20 MR. GALLUZZO: Objection to form. Vague.
21 THE WITNESS: Do I answer?
22 MR. GALLUZZO: Give him a moment to sit back
23 down.
24 THE WITNESS: Okay.
25 BY MR. PADMANABHAN:

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<p>1 Q. Do you need the question again, 2 Mr. Holobinko? 3 A. Yes, please. 4 Q. Would you agree that the scope of performance 5 metric is broader than the scope of SNR related 6 metric? 7 MR. GALLUZZO: Objection to form. Vague. 8 BY MR. PADMANABHAN: 9 Q. You can go ahead and answer. 10 A. Okay. A performance -- an SNR metric or an 11 SNR related metric is a performance metric. 12 Performance metric may be broader. 13 Q. You say, "may be." I want to understand, in 14 your opinion, is performance metric, as recited in 15 this passage of the '682 patent, broader than SNR 16 related metric? 17 A. The -- for the purpose of the patent, the SNR 18 metric is performance metric. 19 Q. So in your opinion -- 20 A. So I can't -- 21 Q. Go ahead. 22 A. No. 23 Q. Finish your response, please. 24 A. Okay. I'm finished. Thank you. 25 Q. So in your opinion, performance metric has</p> <p style="text-align: right;">Page 10</p>	<p>1 MR. GALLUZZO: Objection to form. Vague. 2 THE WITNESS: So performance metric may be 3 the result of SNR metrics. 4 BY MR. PADMANABHAN: 5 Q. Is it broader or the same in scope? 6 A. It's somewhat different in scope. It is 7 determined from -- as it says in the patent -- 8 THE WITNESS: Give me -- I'm going to pause 9 for a second. 10 (The witness reviewed material.) 11 MR. GALLUZZO: Mr. Holobinko, if in your 12 answer you're referring to something, just make sure 13 you reference that in the record. 14 THE WITNESS: Okay. Thank you. 15 (The witness further reviewed material.) 16 THE WITNESS: So the patent refers to a 17 performance, for example, of a channel, and so SNR 18 related metric is related to that, and performance 19 could include other factors. 20 BY MR. PADMANABHAN: 21 Q. Okay. So in your opinion, performance metric 22 is broader because it can include things beyond an SNR 23 related metric. 24 Is that fair? 25 A. It might include -- it might include more.</p> <p style="text-align: right;">Page 12</p>
<p>1 the same scope as SNR related metric in the 2 '682 patent? 3 MR. GALLUZZO: Objection to form. Vague. 4 When I object, unless I tell you not to 5 answer, if you understand the question, you can 6 answer. 7 THE WITNESS: Okay. So "performance" can 8 include things other than the SNR metric, but for the 9 purpose of the patent, the patent refers to the 10 performance of the transmission layer. 11 BY MR. PADMANABHAN: 12 Q. That's not what I asked, Mr. Holobinko. 13 A. I'm sorry. 14 Q. I'm going to try and ask it again. 15 In your opinion, in the context of the 16 '682 patent, is a performance metric broader or the 17 same in scope as an SNR related metric? 18 MR. GALLUZZO: Objection to form. Vague. 19 THE WITNESS: I've answered it the best I 20 can. 21 BY MR. PADMANABHAN: 22 Q. Okay. I need to understand your answer 23 again. So in your opinion, in the context of the 24 '682 patent, is performance metric broader in scope 25 than SNR related metric?</p> <p style="text-align: right;">Page 11</p>	<p>1 Q. So in Lines 56 through 58 -- so Column 3, 2 Lines 56 through 58, it says, "(e.g. an SNR related 3 metric such as SNR at a particular frequency or SNR 4 over a range of frequencies (an SNR profile), noise 5 levels, strength of desired signals, and/or the 6 like)." 7 Do you see that? 8 (The witness reviewed material.) 9 THE WITNESS: Yes. 10 BY MR. PADMANABHAN: 11 Q. In your opinion, everything after the e.g. 12 within that parenthesis on Column 3, Lines 56 through 13 58, are all SNR related metrics; correct? 14 (The witness further reviewed material.) 15 THE WITNESS: I'm sorry. Which lines are you 16 referring to as "those things"? Oh. Excuse me. That 17 would be "noise levels, strength of desired signals." 18 Is that what you're referring to? 19 BY MR. PADMANABHAN: 20 Q. Correct. In your opinion, those two items 21 are also SNR related metrics; correct? 22 A. Yes. 23 Q. Okay. And then it says, "and/or the like." 24 Do you see that? 25 A. Yes.</p> <p style="text-align: right;">Page 13</p>

<p>1 Q. You'd agree that this passage does not tell 2 you how a metric must be like SNR to be SNR related; 3 correct? 4 MR. GALLUZZO: Objection to form. 5 THE WITNESS: Yes. But a person of ordinary 6 skill in the art would not understand exactly the 7 kinds of things that are being referred to here. 8 BY MR. PADMANABHAN: 9 Q. They would know exactly what is or is not 10 like SNR such that it's SNR related? 11 A. Yes. 12 Q. Can you give me the full list of metrics that 13 would be SNR related metrics based on Column 3, 14 Lines 53 to 59? 15 MR. GALLUZZO: Objection to form. Vague. 16 THE WITNESS: The patent doesn't say that 17 there is a specific set. That's why it uses "and the 18 like," but it uses things similar that a POSITA would 19 understand. I would refer to the previous patents 20 that also bring up BER, and it's mentioned. 21 Symbol-to-noise ratio, things that are the like. 22 BY MR. PADMANABHAN: 23 Q. Okay. So what I'm asking for -- well, let's 24 take a pause. 25 Mr. Holobinko, you're a person of ordinary</p> <p style="text-align: right;">Page 14</p>	<p>1 BY MR. PADMANABHAN: 2 Q. So there are more than just what's explicitly 3 listed there; correct? 4 A. Correct. 5 Q. Okay. So what I'm asking you is can you give 6 me a list of other metrics that existed, as of 2012, 7 that you believe would be SNR related metrics? 8 A. Sure. MER. 9 Q. Any others? 10 A. Power level. 11 Q. Any others? 12 A. BER. 13 Q. Any others? 14 A. Symbol to noise. 15 Q. Okay. So when you say, "power level," that's 16 strength of the signal; right? 17 A. Power level is defined. So that's the power 18 level coming into the cable modem for a given signal. 19 Q. That's the numerator in signal-to-noise 20 ratio; correct? 21 A. No. 22 Q. Okay. So how is it different? 23 A. It is the RF power. 24 Q. Okay. Any other metrics that you would say 25 are "and/or the like"?</p> <p style="text-align: right;">Page 16</p>
<p>1 skill in the art; correct? 2 A. Yes. 3 Q. Okay. So based on your knowledge as a person 4 of ordinary skill in the art and disclosure in the 5 '682 patent, can you tell me all of the metrics that 6 you believe qualify as "and/or the like"? 7 MR. GALLUZZO: Objection to form. Vague. 8 THE WITNESS: I can tell you if a metric 9 conforms to "and the like," but a metric could be 10 invented that isn't made yet but would still conform 11 completely to "as the like." A measure of signal 12 quality. 13 BY MR. PADMANABHAN: 14 Q. I understand that's what you said in your 15 declaration, that you said that it's a measure of 16 signal quality, but what I'm asking is whether or not 17 you can list out -- well, strike that. Let's ask it 18 slightly differently. 19 You would agree that in Column 3 of the '682 20 at Line 58 and 59, when it says, "and/or the like," 21 it's expanding SNR related metric beyond the 22 explicitly listed metrics in that passage; correct? 23 MR. GALLUZZO: Objection to form. 24 Sorry, Mr. Holobinko. Go ahead. 25 THE WITNESS: It is saying there are others.</p> <p style="text-align: right;">Page 15</p>	<p>1 A. There might be others. Those are the ones 2 that come to my mind as a POSITA. 3 Q. Now I want to go back to my original question 4 because I don't think you answered it. So I'd like to 5 go back to my original question. 6 In Column 3 at Lines 58 and 59, when it says, 7 "and/or the like," it does not define what it means to 8 be "and/or the like." 9 Is that fair? 10 MR. GALLUZZO: Objection to form. Vague. 11 THE WITNESS: It doesn't specifically define 12 "and the like," but within the patent it says that 13 these are metrics, SNR related metrics, which are 14 measures. 15 BY MR. PADMANABHAN: 16 Q. Okay. So it's saying SNR related metrics," 17 gives you a list, and says, "and/or the like"; 18 correct? 19 A. Yes. Correct. 20 Q. So what I'm asking you is is there anything 21 in the '682 patent that tells you what is like the 22 explicitly listed metrics in Column 3, Lines 54 23 through 59? 24 A. It gives examples through the patent and 25 tells you where those metrics come from. And so to a</p> <p style="text-align: right;">Page 17</p>

<p>1 POSITA, it is very understandable and clear what "and 2 the like" means. 3 Q. And if there are any passages within the 4 '682 patent you're relying upon, you cited those in 5 your expert declarations; correct? 6 A. Yes. 7 (Pause.) 8 MR. PADMANABHAN: Okay. I'd like to go to 9 your opening declaration, which is behind Tab 1 in 10 your binder, and I've added it to the Share as 11 Exhibit 2 to this deposition. Specifically, I would 12 like to go to Paragraph 48. 13 Please let me know when you're there. 14 MR. GALLUZZO: KP, did you say 40 or 48? 15 MR. PADMANABHAN: 48. Can you guys hear me 16 okay? 17 MR. GALLUZZO: Yeah. It was just a little 18 muffled right at that moment. 19 (Deposition Exhibit 2 was marked for 20 identification.) 21 THE WITNESS: I'm there. 22 BY MR. PADMANABHAN: 23 Q. Okay. In the first sentence of Paragraph 48 24 to your declaration you state, "A POSITA would have 25 reasonably understood the boundaries of the term 'SNR</p> <p style="text-align: right;">Page 18</p>	<p>1 noise." 2 Do you see that? 3 A. Yes. 4 Q. Noise can come from cabling; correct? 5 A. No. Noise can come as a result of 6 disturbances within a cable but not from the cable 7 itself -- 8 (Indiscernible crosstalk.) 9 THE WITNESS: -- other than basic, 10 theoretical thermal noise that any electrical engineer 11 understands. 12 BY MR. PADMANABHAN: 13 Q. So noise can come from the environment of the 14 cable; correct? 15 A. Correct. 16 Q. Noise can come from the environment 17 generally; correct? 18 A. Correct. 19 Q. Noise can come from equipment? 20 A. Yes. 21 Q. Where else can noise come from? 22 A. Any number of sources. 23 Q. Can you tell me some of them? 24 A. Repeat the ones that you already gave me as 25 an example, please.</p> <p style="text-align: right;">Page 20</p>
<p>1 related metric' as generally referring to any metrics 2 representing and/or measuring signal quality." Do 3 you see that? 4 A. Yes. 5 Q. So in this passage you're saying that an SNR 6 related metric can be a metric that represents signal 7 quality; correct? 8 A. Correct. 9 Q. And separately you're also saying SNR related 10 metric can be any metric that measures signal quality; 11 correct? 12 A. Yes. 13 MR. PADMANABHAN: Okay. Let's go to your 14 second declaration, which is behind Tab 2 of your 15 binder. And I've introduced that as Exhibit 3 in the 16 Share. 17 (Deposition Exhibit 3 was marked for 18 identification.) 19 MR. PADMANABHAN: I'd like to start at 20 Paragraphs 7 and 8. Let me know when you're there. 21 (Pause.) 22 THE WITNESS: I'm there. 23 BY MR. PADMANABHAN: 24 Q. In Paragraph 7 you say, "It has long been 25 known that network communications are affected by</p> <p style="text-align: right;">Page 19</p>	<p>1 Q. From the environment of the cable, from the 2 environment generally, from equipment. 3 A. From reflections within the cable signal 4 reflections. 5 Q. Now, in Paragraph 8 you say, "The effect of 6 noise in the context of digitally modulated signals is 7 a bedrock of information theory." 8 Do you see that? 9 A. Yes. 10 Q. And you continue and say that "noise has a 11 negative impact on the information carrying capacity 12 of a signaling channel, as Shannon recognized." 13 A. Yes. 14 Q. So Shannon -- when you say when "Shannon 15 recognized," you're talking about Shannon's capacity 16 theorem; correct? 17 A. Yes. 18 Q. And Shannon's capacity theorem sets a 19 theoretical upper bound on the capacity of a channel; 20 correct? 21 A. Yes. 22 Q. So that's a theoretical maximum amount of 23 data that could be passed through a channel; correct? 24 A. Correct. 25 Q. What else can affect the actual capacity of</p> <p style="text-align: right;">Page 21</p>

<p>1 the channel?</p> <p>2 A. The way that the information is encoded on</p> <p>3 the channel.</p> <p>4 Q. Anything else?</p> <p>5 A. That's the one that comes to mind in context</p> <p>6 of your saying "in Shannon."</p> <p>7 Q. Shannon's capacity theorem is not referenced</p> <p>8 in the '682 patent; correct?</p> <p>9 A. I'm not sure.</p> <p>10 Q. Okay. We talked earlier about bit error rate</p> <p>11 and symbol error rate.</p> <p>12 Do you recall that?</p> <p>13 A. Yes.</p> <p>14 Q. Can you input bit error rate into Shannon's</p> <p>15 theorem to get the theoretical limit on capacity?</p> <p>16 MR. GALLUZZO: Objection to form. Vague.</p> <p>17 THE WITNESS: Bit error rate is a measure of</p> <p>18 quality. It's not an input.</p> <p>19 BY MR. PADMANABHAN:</p> <p>20 Q. So, Mr. Holobinko, I'd like you to answer the</p> <p>21 question I asked.</p> <p>22 A. Okay.</p> <p>23 Q. That's helpful.</p> <p>24 A. I'm sorry.</p> <p>25 Q. Can you input bit error rate into Shannon's</p> <p style="text-align: right;">Page 22</p>	<p>1 MR. GALLUZZO: Objection to form.</p> <p>2 THE WITNESS: At the -- under Shannon's</p> <p>3 theory and under the most ideal conditions in the</p> <p>4 absence of noise, the bit error rate would be zero.</p> <p>5 BY MR. PADMANABHAN:</p> <p>6 Q. Would you agree that whether a metric is SNR</p> <p>7 related is based on the degree to which the metric is</p> <p>8 related to measuring the information capacity of the</p> <p>9 channel?</p> <p>10 MR. GALLUZZO: Objection to form.</p> <p>11 THE WITNESS: Would you repeat it again,</p> <p>12 please.</p> <p>13 BY MR. PADMANABHAN:</p> <p>14 Q. Sure.</p> <p>15 Would you agree that whether a metric is SNR</p> <p>16 related is based on the degree to which it is related</p> <p>17 to measuring the information capacity of a channel?</p> <p>18 MR. GALLUZZO: Objection to form.</p> <p>19 THE WITNESS: No. It's -- I would say it's</p> <p>20 related -- it is whether or not it is a similar</p> <p>21 measure to SNR.</p> <p>22 BY MR. PADMANABHAN:</p> <p>23 Q. Okay. Does it matter to what degree of</p> <p>24 similarity a metric is to SNR in determining whether</p> <p>25 it's an SNR related metric?</p> <p style="text-align: right;">Page 24</p>
<p>1 theorem to get a theoretical limit on capacity?</p> <p>2 MR. GALLUZZO: Objection to form. Vague.</p> <p>3 THE WITNESS: I'm not sure. I would have to</p> <p>4 go back to Shannon's theorem and review it again to</p> <p>5 give you that answer.</p> <p>6 BY MR. PADMANABHAN:</p> <p>7 Q. Would you expect a person skilled in the art,</p> <p>8 in reading the '682 patent, to go back and reference</p> <p>9 Shannon's theorem to determine whether any particular</p> <p>10 metric is or is not an SNR related metric?</p> <p>11 A. No. But a POSITA wouldn't have to.</p> <p>12 Q. So --</p> <p>13 A. It's frozen.</p> <p>14 Q. We're not frozen. I'm frozen.</p> <p>15 A. Sorry.</p> <p>16 Q. So Shannon's theorem gives you the maximum</p> <p>17 capacity a channel can hold; correct?</p> <p>18 A. Yes.</p> <p>19 Q. That's the maximum data rate; correct?</p> <p>20 A. I believe so.</p> <p>21 Q. So if you reach Shannon's -- the capacity at</p> <p>22 Shannon's theorem, bit error rate is zero; correct?</p> <p>23 A. I would have to go back to Shannon's theory.</p> <p>24 Q. Same for symbol error rate. You wouldn't</p> <p>25 know if symbol error rate is zero?</p> <p style="text-align: right;">Page 23</p>	<p>1 A. It has to be understood as highly similar and</p> <p>2 used in place of SNR. So it's an SNR related metric.</p> <p>3 Q. So that's my question. Does it matter to</p> <p>4 what degree the metric is related to SNR in order to</p> <p>5 determine whether it's an SNR related metric?</p> <p>6 MR. GALLUZZO: Objection. Asked and</p> <p>7 answered.</p> <p>8 THE WITNESS: As I said, it needs to be</p> <p>9 closely related to SNR such that it can be used in</p> <p>10 place of SNR where SNR isn't available.</p> <p>11 BY MR. PADMANABHAN:</p> <p>12 Q. So you're saying it has to be a substitute</p> <p>13 for SNR; is that right?</p> <p>14 A. Not -- a similar means.</p> <p>15 Q. Well, "yes" or "no," it has to be a</p> <p>16 substitute for SNR?</p> <p>17 MR. GALLUZZO: Objection to form.</p> <p>18 THE WITNESS: Well, you're asking a question</p> <p>19 that doesn't have context.</p> <p>20 BY MR. PADMANABHAN:</p> <p>21 Q. Well, I'm asking you in reading the</p> <p>22 '682 patent is it your opinion that a person of skill</p> <p>23 in the art would understand that in order to be an SNR</p> <p>24 related metric, a metric must be a substitute for SNR?</p> <p>25 A. Yes.</p> <p style="text-align: right;">Page 25</p>

<p>1 Q. Is whether a metric is a substitute for SNR 2 dependent on the particular application? 3 A. Yes. And let me clarify. 4 If you're in advanced modulation techniques, 5 you need to have these SNR related metrics to 6 understand the equivalent of SNR because the classic 7 SNR measurement isn't available. 8 Q. Does it say anywhere in the '682 patent that 9 SNR is not available? 10 A. A person -- no. A person of skill in the art 11 would know, from many years dating back to the early 12 2000s, that classic SNR cannot not measured on a QAM 13 or an OFDM channel the way it's measured on an analog 14 channel. 15 Q. Well, the '682 patent, at Column 3 -- 16 A. Uh-huh. 17 Q. -- Line 56 and 57 and 58 says that an SNR 18 related metric could be SNR on a particular frequency 19 or SNR over a range of frequencies; correct? 20 A. Correct. So if we were talking about -- 21 (Indiscernible crosstalk.) 22 BY MR. PADMANABHAN: 23 Q. Go ahead. 24 A. Excuse me for interrupting. 25 MR. GALLUZZO: Mr. Holobinko, I think KP is</p> <p style="text-align: right;">Page 26</p>	<p>1 related metric, a person of skill would determine 2 whether it was a substitute for SNR. 3 Do you recall that testimony? 4 A. Yes. 5 Q. Does it matter what the specific application 6 is in determining whether or not a particular metric 7 is a substitute for SNR? 8 A. Repeat one more time, please. 9 Q. Does it matter what you intend to use the 10 metric for in determining whether it is a substitute 11 for SNR? 12 A. In the context of the patent that refers to 13 the transmission layer, no. 14 Q. Where does the patent -- is there anywhere in 15 your declaration where you discuss how the patent 16 references the transmission layer? 17 A. It's the tran- -- 18 THE WITNESS: I have to look through. 19 (The witness reviewed material.) 20 MR. PADMANABHAN: Why don't we take a 21 two-minute break, and we can return to that. 22 MR. GALLUZZO: Hold on a second. 23 MR. PADMANABHAN: Do you want him to answer 24 the question now before we break? 25 MR. GALLUZZO: I'm just going to object to</p> <p style="text-align: right;">Page 28</p>
<p>1 giving you a chance to finish your answer. 2 Is that right? 3 MR. PADMANABHAN: I was trying to, but why 4 don't I ask my question. 5 MR. GALLUZZO: Hold on a second. 6 Did you have more to answer? 7 It's difficult with video. So I'm trying to 8 referee. 9 Did you have more to answer, Mr. Holobinko? 10 THE WITNESS: Yes. 11 There's a difference between a signal and a 12 channel. 13 BY MR. PADMANABHAN: 14 Q. I'll ask my question again, Mr. Holobinko. 15 The '682 patent at Column 3, Line 68 -- 16 sorry. 56 through 58 references measuring SNR at a 17 particular frequency; correct? 18 A. Correct. 19 Q. And SNR over a range of frequencies; correct? 20 A. Correct. 21 Q. So the '682 contemplates measuring SNR; 22 correct? 23 A. Yes. 24 Q. So I want to go back to your statement that 25 in order to determine whether a metric is an SNR</p> <p style="text-align: right;">Page 27</p>	<p>1 taking a break while you're having him answer one of 2 your questions. If you -- 3 (Indiscernible crosstalk.) 4 MR. PADMANABHAN: I'll re-ask the question 5 after the break. 6 MR. GALLUZZO: Okay. That's fine. 7 MR. PADMANABHAN: Okay. Let's go off the 8 record. 9 (A recess was taken from 9:32 a.m. 10 to 9:37 a.m.) 11 BY MR. PADMANABHAN: 12 Q. Mr. Holobinko, is noise a substitute for SNR? 13 (The witness reviewed material.) 14 THE WITNESS: A noise level can be a 15 substitute for SNR, as it states in the patent. 16 BY MR. PADMANABHAN: 17 Q. Okay. So when you say, "noise level," what 18 are you referencing? 19 A. The signal. 20 Q. It's just a measurement of noise; correct? 21 A. Noise level is always relative to a -- well, 22 there's a reference level of noise, as a POSITA would 23 know. 24 Q. How about strength of desired signals? Is 25 that a substitute for SNR?</p> <p style="text-align: right;">Page 29</p>

<p>1 (The witness reviewed material.)</p> <p>2 THE WITNESS: Strength of desired signal can</p> <p>3 be a measure, yes.</p> <p>4 BY MR. PADMANABHAN:</p> <p>5 Q. You say, "can be." Are there instances when</p> <p>6 strength of desired signal cannot be a substitute for</p> <p>7 SNR?</p> <p>8 A. Strength of a desired signal is a parameter</p> <p>9 that can be used to determine SNR or SNR equivalent.</p> <p>10 Q. Why don't you start by telling me what is</p> <p>11 strength of desired signal?</p> <p>12 A. The strength of desired signal, strength is</p> <p>13 equivalent to magnitude. A signal that's too high</p> <p>14 will create issues. A signal that's too low will</p> <p>15 create issues. So strength of a signal in that</p> <p>16 context is an indicator.</p> <p>17 Q. Is strength of the desired signal the</p> <p>18 numerator in SNR?</p> <p>19 A. Yes.</p> <p>20 Q. So --</p> <p>21 MR. GALLUZZO: Hold on.</p> <p>22 Were you finished?</p> <p>23 THE WITNESS: I'm finished.</p> <p>24 MR. GALLUZZO: Okay. Thank you.</p> <p>25 BY MR. PADMANABHAN:</p> <p style="text-align: right;">Page 30</p>	<p>1 related metric eliminated the transmission layer?</p> <p>2 A. No. The patent is defined at the</p> <p>3 transmission layer.</p> <p>4 Q. So I'm going to ask my question again,</p> <p>5 Mr. Holobinko.</p> <p>6 Is there anyplace in either of your two</p> <p>7 declarations where you explain that the '682 patent</p> <p>8 requires SNR related metrics to be measured at the</p> <p>9 transmission layer?</p> <p>10 MR. GALLUZZO: Objection. Asked and</p> <p>11 answered.</p> <p>12 (The witness reviewed material.)</p> <p>13 THE WITNESS: I would refer you to</p> <p>14 Paragraphs 17 and 18 in my rebuttal, for which a</p> <p>15 POSITA would have no difficulty understanding the</p> <p>16 reference. And if you go to Page 6, the first line,</p> <p>17 the "fundamental communications property." So the</p> <p>18 communications are done at the transport layer, a</p> <p>19 POSITA would understand that.</p> <p>20 BY MR. PADMANABHAN:</p> <p>21 Q. Paragraphs 17 and 18 don't make any reference</p> <p>22 to the transmission layer, do they?</p> <p>23 A. The answer doesn't make sense outside the</p> <p>24 transmission layer.</p> <p>25 Q. Okay. Let's go to Paragraph 11 of your</p> <p style="text-align: right;">Page 32</p>
<p>1 Q. Is strength of desired signal as a numerator</p> <p>2 in SNR, whether or not it's a substitute for SNR</p> <p>3 depends on what the noise level is; right?</p> <p>4 A. As I referenced previously, in an SNR</p> <p>5 measurement, that's correct, but in terms of measuring</p> <p>6 quality, as I measured -- in terms of the other use of</p> <p>7 strength of signal, I told you in terms of too high,</p> <p>8 too low.</p> <p>9 Q. In what instances is strength of signal not a</p> <p>10 substitute for SNR?</p> <p>11 (Pause.)</p> <p>12 THE WITNESS: When you don't know the noise</p> <p>13 level.</p> <p>14 BY MR. PADMANABHAN:</p> <p>15 Q. Is BER a substitute for SNR?</p> <p>16 A. It can be.</p> <p>17 Q. In what instances is BER not a substitute for</p> <p>18 SNR?</p> <p>19 A. The only instance I can think of is if you're</p> <p>20 measuring it outside the bounds of the transmission</p> <p>21 layer.</p> <p>22 (Pause.)</p> <p>23 BY MR. PADMANABHAN:</p> <p>24 Q. In your declarations, do you identify</p> <p>25 anyplace in the '682 patent that requires that SNR</p> <p style="text-align: right;">Page 31</p>	<p>1 declaration -- your rebuttal declaration, which is</p> <p>2 Exhibit 3 to your deposition.</p> <p>3 A. Okay.</p> <p>4 Q. You say, "SNR is not the only measurement</p> <p>5 that indicates the signal quality and thus the</p> <p>6 performance of a signaling channel. Various SNR</p> <p>7 related metrics are 'related' to SNR in the sense that</p> <p>8 they measure the same fundamental communications</p> <p>9 property as SNR - the information carrying capacity</p> <p>10 (i.e., 'quality' or 'performance') of a channel."</p> <p>11 Do you see that?</p> <p>12 A. Yes.</p> <p>13 Q. Is the quality of a channel different than</p> <p>14 the information-carrying capacity of a channel?</p> <p>15 A. I think they're pretty well synonymous.</p> <p>16 Q. Is the performance of a channel different</p> <p>17 than the information-carrying capacity of a channel?</p> <p>18 A. In terms of they're synonymous.</p> <p>19 Q. You don't cite any documents in support of</p> <p>20 your opinion in Paragraph 11 regarding the</p> <p>21 understanding of a person of ordinary skill; correct?</p> <p>22 A. I do not -- I do not cite a document.</p> <p>23 Q. Can you identify the list of metrics that</p> <p>24 measure the information-carrying capacity of a</p> <p>25 channel?</p> <p style="text-align: right;">Page 33</p>

<p>1 A. The total number of bits, the total number of 2 symbols measured over time. 3 Q. And would you agree that any metric that 4 assesses the total number of bits over time is an SNR 5 related metric? 6 A. If it's measured across the transmission 7 layer, yes. 8 Q. When you say, "the transmission layer," what 9 are you referring to? 10 A. Referring to the demarcation point of the 11 CMTS through the network to the cable modem. 12 Q. So let's talk about a downstream signal 13 received at the cable mode. 14 Are you with me? 15 A. Yes. 16 Q. In that instance, any SNR you measure would 17 involve the cable modem; correct? 18 A. SNR can be measured independent of the cable 19 modem, but in the context of this, yes. 20 Q. When you say, "in the context of this," you 21 mean in the context of the '682 patent? 22 A. Yes. 23 Q. So any SNR measurement performed using the 24 cable modem would involve a noise introduced, for 25 example, by the cable modem?</p> <p style="text-align: right;">Page 34</p>	<p>1 They'd be unreliable. 2 Q. Have you heard of "LTE ingress"? 3 A. Yes. 4 Q. What's LTE ingress? 5 A. It's a phenomenon that occurs in cable 6 systems as a result of interference from LTE signals 7 getting into the cable plant. 8 Q. And what's LTE? 9 A. Cellular-type signals. 10 Q. And cellular-type signals can be generated by 11 having, for example, a cellular access point in your 12 home; right? 13 A. They can -- that's one point, yes. 14 Q. And it could be from having multiple cell 15 phones routing on your cable modem? 16 A. Excuse me? 17 Q. It could be from having multiple cell phones 18 routing on your cable modem? 19 A. I don't know that for a fact. 20 Q. You don't know one way or the other? 21 MR. GALLUZZO: You have to give a verbal 22 answer if you understand the question. 23 THE WITNESS: I have to give a verbal answer? 24 MR. GALLUZZO: If you understand the 25 question.</p> <p style="text-align: right;">Page 36</p>
<p>1 MR. GALLUZZO: Objection to form. 2 THE WITNESS: Yes. However slight that is, 3 you're correct. 4 BY MR. PADMANABHAN: 5 Q. And that's something beyond what you're 6 calling "the transmission layer"; correct? 7 A. No. 8 Q. Okay. So, again, help me understand what you 9 mean by "the transmission layer"? 10 MR. GALLUZZO: Objection. Asked and 11 answered. 12 BY MR. PADMANABHAN: 13 Q. Go ahead. You can answer. 14 A. Well, you're speaking about a measurement 15 device, and any measurement device has noise 16 associated with it, as a POSITA would know. The 17 question is whether the noise introduced by that 18 device affects the measurement. 19 And so you asked if the modem, in its 20 measurement, introduces noise, yes. It's negligible 21 compared to the measurement. 22 Q. You're assuming it's negligible; correct? 23 A. As a POSITA, I know it's negligible or test 24 equipment wouldn't work, all the measurements across 25 the cable TV industry since Day 1 wouldn't work.</p> <p style="text-align: right;">Page 35</p>	<p>1 THE WITNESS: Oh. I'm sorry. 2 So I don't know for certain if they will 3 affect the insides of the cable modem. 4 BY MR. PADMANABHAN: 5 Q. Okay. Let's go back to information-carrying 6 capacity of a signal. 7 Are you with me? 8 A. Yes. 9 Q. Would you agree that any metric that has a 10 negative impact on the information-carrying capacity 11 of a signaling channel is SNR related? 12 A. You said that fast. So please repeat it one 13 more time. 14 Q. Yeah, I'll repeat it. 15 Would you agree that any metric that has a 16 negative impact on the information-carrying capacity 17 of a channel is SNR related? 18 A. It would only be if it's measurable impact. 19 Things can impact and be impacted by. It's whether 20 it's measurable. 21 Q. So is it situation dependent, if the metric 22 is large enough that it causes impact, then it's an 23 SNR related metric? 24 MR. GALLUZZO: Objection to form. Vague. 25 THE WITNESS: No. Something can be</p> <p style="text-align: right;">Page 37</p>

<p>1 measurable, and because its measure is so small it</p> <p>2 doesn't have an impact on signal quality, but it needs</p> <p>3 to be measurable.</p> <p>4 BY MR. PADMANABHAN:</p> <p>5 Q. You mean it needs to be physically able to be</p> <p>6 measured?</p> <p>7 A. And related to signal quality, yes.</p> <p>8 Q. So let's go with the "related" part. That's</p> <p>9 what I'm trying to understand.</p> <p>10 A. Uh-huh.</p> <p>11 Q. Would you agree that any measurable metric</p> <p>12 that has a negative impact on the information-carrying</p> <p>13 capacity of a channel is SNR related?</p> <p>14 MR. GALLUZZO: Objection. Asked and</p> <p>15 answered.</p> <p>16 (The witness reviewed material.)</p> <p>17 BY MR. PADMANABHAN:</p> <p>18 Q. Mr. Holobinko, do you have an answer?</p> <p>19 THE WITNESS: I'm referring back to my</p> <p>20 response. Give me a moment, please.</p> <p>21 (Pause in proceedings.)</p> <p>22 THE WITNESS: So repeat one more time for me.</p> <p>23 Indulge me.</p> <p>24 BY MR. PADMANABHAN:</p> <p>25 Q. Would you agree that any measurable metric</p> <p style="text-align: right;">Page 38</p>	<p>1 Q. Would you agree that noise is not the only</p> <p>2 physical impairment to the information capacity of a</p> <p>3 channel?</p> <p>4 A. Yes.</p> <p>5 Q. Would you agree the following impact</p> <p>6 information capacity of a channel intersymbol</p> <p>7 interference --</p> <p>8 (Indiscernible crosstalk.)</p> <p>9 BY MR. PADMANABHAN:</p> <p>10 Q. Strike that. Let me ask it --</p> <p>11 A. So sorry.</p> <p>12 MR. GALLUZZO: Hold on just a minute for some</p> <p>13 refereeing.</p> <p>14 Mr. Holobinko, just give it a moment after a</p> <p>15 question. With the video, things are more difficult</p> <p>16 than in person.</p> <p>17 BY MR. PADMANABHAN:</p> <p>18 Q. Mr. Holobinko, would you agree that</p> <p>19 intersymbol interference impacts the information</p> <p>20 capacity of a channel?</p> <p>21 A. Yes.</p> <p>22 Q. Would you agree that clipping impacts the</p> <p>23 information capacity of a channel?</p> <p>24 A. It may or may not.</p> <p>25 Q. Would you agree that quantization impacts the</p> <p style="text-align: right;">Page 40</p>
<p>1 that has a negative impact on the information-carrying</p> <p>2 capacity of a channel is an SNR related metric?</p> <p>3 MR. GALLUZZO: Objection. Asked and</p> <p>4 answered.</p> <p>5 THE WITNESS: The measurable metric has to be</p> <p>6 related to signal quality. So I can't just take any</p> <p>7 metric and say that that's related to signal quality.</p> <p>8 It has to be similar to as in the SNR like.</p> <p>9 (The Reporter requested clarification.)</p> <p>10 THE WITNESS: Oh. Excuse me. L-i-k-e.</p> <p>11 (Pause.)</p> <p>12 BY MR. PADMANABHAN:</p> <p>13 Q. Would you agree that any metric that is</p> <p>14 correlated to the information-carrying capacity of a</p> <p>15 channel is SNR related?</p> <p>16 MR. GALLUZZO: Objection to form. Vague.</p> <p>17 THE WITNESS: Repeat one more time.</p> <p>18 BY MR. PADMANABHAN:</p> <p>19 Q. Would you agree that any metric that is</p> <p>20 correlated to the information-carrying capacity of a</p> <p>21 channel is an SNR related metric?</p> <p>22 MR. GALLUZZO: Objection to form. Vague.</p> <p>23 THE WITNESS: No. "Correlated" is a term</p> <p>24 which to me is too vague.</p> <p>25 BY MR. PADMANABHAN:</p> <p style="text-align: right;">Page 39</p>	<p>1 information capacity of a channel?</p> <p>2 A. The degree of quantization, but I'm not sure</p> <p>3 otherwise.</p> <p>4 Q. Is intersymbol interference an SNR related</p> <p>5 metric?</p> <p>6 A. No.</p> <p>7 Q. Is clipping an SNR related metric?</p> <p>8 A. As I said, it is not -- it might be in some</p> <p>9 cases, and it might not be in others.</p> <p>10 Q. Would you agree that SNR does not actually</p> <p>11 tell you the bits per second that a channel would</p> <p>12 actually carry?</p> <p>13 A. I agree with that. That depends on the</p> <p>14 encoding of the channel or the signal.</p> <p>15 Q. Does it rely on things beyond just the</p> <p>16 encoding and the SNR?</p> <p>17 A. Repeat the question, please.</p> <p>18 Q. The number of bits per second that a channel</p> <p>19 can carry, does it rely on more than just SNR and</p> <p>20 encoding?</p> <p>21 (The witness reviewed material.)</p> <p>22 THE WITNESS: Again, it relies on the noise</p> <p>23 and the other things that are measured by SNR and SNR</p> <p>24 equivalent measures.</p> <p>25 BY MR. PADMANABHAN:</p> <p style="text-align: right;">Page 41</p>

<p>1 Q. Okay.</p> <p>2 A. SNR related measures, to be clear.</p> <p>3 Q. So, Mr. Holobinko, it's a little bit</p> <p>4 circular. You're saying that SNR related metrics are</p> <p>5 things that measure signal quality and then that</p> <p>6 measure information capacity of the channel, and then</p> <p>7 I'm asking you -- well, strike that. We'll come back</p> <p>8 to it.</p> <p>9 Let's talk about bit error rate.</p> <p>10 Would you agree that bit error rate is</p> <p>11 affected by factors other than those that affect</p> <p>12 channel quality?</p> <p>13 (The witness reviewed material.)</p> <p>14 THE WITNESS: So say that one more time.</p> <p>15 BY MR. PADMANABHAN:</p> <p>16 Q. Would you agree that bit error rate is</p> <p>17 affected by factors other than those that affect</p> <p>18 channel quality?</p> <p>19 A. Not channel quality but signal quality.</p> <p>20 Q. Okay. I'll ask it again. Would you agree</p> <p>21 that bit error rate is affected by factors other than</p> <p>22 those that affect signal quality?</p> <p>23 A. No.</p> <p>24 Q. Can processing problems at the receiver</p> <p>25 affect bit error rate?</p> <p style="text-align: right;">Page 42</p>	<p>1 BY MR. PADMANABHAN:</p> <p>2 Q. I'm asking -- I'm saying so in the situation</p> <p>3 where there's some non-zero SNR but the signal is</p> <p>4 still received, the 4-QAM signal is still received</p> <p>5 with no errors, that's because the noise is sufficient</p> <p>6 to move the bits out of the appropriate range on the</p> <p>7 IQ graph; right?</p> <p>8 MR. GALLUZZO: Objection to form. Vague.</p> <p>9 THE WITNESS: The signal-to-noise is</p> <p>10 sufficient to support 4-QAM. That's what that's</p> <p>11 telling me.</p> <p>12 BY MR. PADMANABHAN:</p> <p>13 Q. It's just that the noise is not sufficient to</p> <p>14 cause a decoding error; right?</p> <p>15 MR. GALLUZZO: Objection to form.</p> <p>16 THE WITNESS: No. You're incorrect. The</p> <p>17 noise stays the same. It's the signal to the noise.</p> <p>18 BY MR. PADMANABHAN</p> <p>19 Q. I guess my point is if the signal-to-noise is</p> <p>20 the same and you have zero errors at 4-QAM -- zero bit</p> <p>21 errors at 4-QAM, you may have bit errors at 8-QAM;</p> <p>22 right?</p> <p>23 A. That's correct.</p> <p>24 Q. So the modulation rate can affect the bit</p> <p>25 error rate; correct?</p> <p style="text-align: right;">Page 44</p>
<p>1 A. Processing problems at the receiver decoding</p> <p>2 the signal could affect the quality -- the bit error</p> <p>3 rate, yes.</p> <p>4 Q. Can the method of encoding impact the bit</p> <p>5 error rate?</p> <p>6 A. Not unless the encoder isn't working</p> <p>7 properly.</p> <p>8 Q. Can the modulation rate affect the bit error</p> <p>9 rate?</p> <p>10 A. Only if the modulation rate isn't supported</p> <p>11 by the SNR required for the modulation.</p> <p>12 Q. Well, follow my example. Let's say you've</p> <p>13 got a channel that's got some non-zero signal-to-noise</p> <p>14 ratio but still is able to support 4-QAM with no</p> <p>15 errors. Are you with me?</p> <p>16 A. Yes.</p> <p>17 Q. This doesn't mean the channel is noise free;</p> <p>18 correct?</p> <p>19 A. Correct.</p> <p>20 MR. GALLUZZO: Objection to form.</p> <p>21 BY MR. PADMANABHAN:</p> <p>22 Q. It just means that the noise doesn't push the</p> <p>23 symbols out of their target areas on the IQ?</p> <p>24 MR. GALLUZZO: Objection to form.</p> <p>25 THE WITNESS: What are you asking me?</p> <p style="text-align: right;">Page 43</p>	<p>1 A. The modulation rate can be affected by the</p> <p>2 signal level in that if the signal to the noise is</p> <p>3 inadequate, you will get errors based at that QAM</p> <p>4 encoding rate.</p> <p>5 Q. Can bit synchronization affect bit error</p> <p>6 rate? Let me ask it again clearly.</p> <p>7 Can bit synchronization affect bit error</p> <p>8 rate?</p> <p>9 A. Yes.</p> <p>10 Q. Can intersymbol interference affect bit error</p> <p>11 rate?</p> <p>12 A. Yes.</p> <p>13 Q. Is bit error rate synonymous with capacity?</p> <p>14 MR. GALLUZZO: Objection to form. Vague.</p> <p>15 THE WITNESS: No.</p> <p>16 BY MR. PADMANABHAN:</p> <p>17 Q. Why not?</p> <p>18 A. Because a bit error rate is measured for a</p> <p>19 given capacity. It's not a measure of capacity.</p> <p>20 Q. So bit error rate is almost like how much</p> <p>21 less than total capacity you're going to get; right?</p> <p>22 MR. GALLUZZO: Objection to form. Vague.</p> <p>23 BY MR. PADMANABHAN:</p> <p>24 Q. Well, let me ask it with real numbers.</p> <p>25 If the capacity of a channel is 10 megabits</p> <p style="text-align: right;">Page 45</p>

<p>1 per second and your bit error rate is 1 megabit per 2 second, you'll only get 9 megabits per second. 3 Is that fair? 4 MR. GALLUZZO: Objection to form. Vague. 5 THE WITNESS: If your corrected bit error 6 rate ends up with 1 megabit per second of errors still 7 in the system, then you'll have a throughput of 8 9 megabits. I think 10 megabits is the reference? 9 BY MR. PADMANABHAN: 10 Q. Correct. 11 And when you say, "corrected," you're saying 12 that because some of the bit errors may not be 13 corrected or -- you're basically saying assuming that 14 the 1 megabit per second is the total set of errors; 15 correct? 16 MR. GALLUZZO: Objection to form. 17 THE WITNESS: (No audible response.) 18 BY MR. PADMANABHAN: 19 Q. You need to verbally respond, Mr. Holobinko. 20 A. I'm sorry. I was waiting. So I'm saying the 21 total amount of errors before correction -- I mean 22 after correction. Excuse me. 23 Q. In a theoretically noiseless transmission 24 network, you will still have some bit errors solely 25 attributable to the receiving device; correct?</p> <p style="text-align: right;">Page 46</p>	<p>1 A. If it's in accordance with Paragraph 25, if 2 it's measured purely in terms of the physical channel. 3 Q. So excluding the impact of the receiver? 4 A. Not excluding the impact of the receiver. 5 Everything associated with the physical channel. 6 Q. Is the receiver part of the physical channel? 7 A. Sure, because ultimately, you're looking at 8 the quality that gets delivered at the cable modem. 9 So that's part of it, like every component in the 10 physical channel across the transmission layer. 11 (Pause.) 12 BY MR. PADMANABHAN: 13 Q. Is it fair that, in measuring throughput at 14 the receiving device, you don't know what impact 15 signal-to-noise ratio had on the throughput? 16 A. No, because at the point that you're asking 17 of throughput, there can only be two things measured, 18 the bits or the symbols. 19 (Pause.) 20 BY MR. PADMANABHAN: 21 Q. Is symbol error rate synonymous with 22 information capacity of a channel? 23 A. "Is symbol error rate synonymous with 24 capacity?" No. It's a measure of effective capacity, 25 similar to signal to noise.</p> <p style="text-align: right;">Page 48</p>
<p>1 A. Yes. 2 Q. Okay. Let's go to Paragraph 25 -- 3 (Indiscernible crosstalk.) 4 THE WITNESS: Okay. Go. 5 BY MR. PADMANABHAN: 6 Q. Let's go to Paragraph 25 of your rebuttal 7 declaration. And here you're talking about 8 throughput. 9 It says, "In my opinion the situation is easy 10 for a person of ordinary skill in the art to sort out. 11 If throughput is measured purely in terms of the 12 physical channel such that it provides a measure of 13 signal quality, then that particular 'throughput' 14 could serve as an SNR related metric. However, when 15 throughput does not provide a measure of signal 16 quality, it is not necessarily a metric." 17 Do you see that? 18 A. Yes. 19 Q. So it's your opinion that sometimes 20 throughput is an SNR related metric and sometimes 21 throughput is not an SNR related metric; correct? 22 A. Yes. That is in terms of what is defined as 23 "throughput." 24 Q. What would you need to know to determine if 25 throughput is an SNR related metric?</p> <p style="text-align: right;">Page 47</p>	<p>1 Q. So let me go back to throughput. 2 How much beyond just the channel could be 3 measured by throughput for it to still be an SNR 4 related metric? 5 MR. GALLUZZO: Objection to form. Vague. 6 THE WITNESS: You're asking me to quantify 7 how much? Re-ask the question, please. Repeat the 8 question. 9 BY MR. PADMANABHAN: 10 Q. How much beyond just the channel could be in 11 a measurement of throughput such that it still is an 12 SNR related metric? 13 MR. GALLUZZO: Objection to form. Vague. 14 THE WITNESS: The term "throughput" has to be 15 defined for a particular -- with a particular set of 16 boundaries in the network. And so as I have stated 17 before -- and I'll state again -- is if we're talking 18 about throughput of bits and symbols, then it is the 19 transmission layer, and so that's how it is bounded to 20 be an SNR related metric. 21 BY MR. PADMANABHAN: 22 Q. Is signal-to-noise ratio a useful indicator 23 of signal quality in a noisy environment? 24 A. Yes. 25 Q. So I'd like to turn you to Paragraph 23 of</p> <p style="text-align: right;">Page 49</p>

<p>1 your rebuttal declaration. At Line 21 you say,</p> <p>2 "Throughput is not a useful indicator of the signal</p> <p>3 quality in a noisy environment."</p> <p>4 Do you see that?</p> <p>5 THE WITNESS: Give me one moment, please, to</p> <p>6 review.</p> <p>7 (The witness reviewed material.)</p> <p>8 THE WITNESS: Yes. So please ask your</p> <p>9 question again.</p> <p>10 BY MR. PADMANABHAN:</p> <p>11 Q. Well, first off, do you agree with the</p> <p>12 sentence in your declaration on Lines 21 and 22 of</p> <p>13 Paragraph 23?</p> <p>14 A. Oh, yes.</p> <p>15 Q. Okay. And so in Paragraph 25 you say that</p> <p>16 "'throughput' could serve as an SNR related metric";</p> <p>17 correct?</p> <p>18 A. Correct.</p> <p>19 Q. And in Paragraph 23 you say it's not a useful</p> <p>20 indicator of signal quality --</p> <p>21 A. Oh, no.</p> <p>22 Q. -- if it's too noisy; correct?</p> <p>23 A. Oh, no. No. No. It's related to</p> <p>24 Dr. Chatterjee's definition of throughput and the</p> <p>25 term. So throughput may sometimes be impacted by SNR,</p> <p style="text-align: right;">Page 50</p>	<p>1 channel?</p> <p>2 A. I need to know that it's related to the</p> <p>3 information capacity of the channel and not of the</p> <p>4 network as a whole.</p> <p>5 Q. Well, in Paragraph 23 you say, "Throughput</p> <p>6 broadly refers to an amount of information, per unit</p> <p>7 time, that can be transmitted through a communications</p> <p>8 network."</p> <p>9 A. Yes.</p> <p>10 Q. Do you agree with that statement in your</p> <p>11 declaration?</p> <p>12 A. Yes.</p> <p>13 Q. And it's that definition of throughput that</p> <p>14 you say can or cannot be an SNR related metric;</p> <p>15 correct?</p> <p>16 A. No. The second word of my sentence on</p> <p>17 Paragraph 23 is the keyword. "Throughput broadly</p> <p>18 refers to an amount of information." That's not a</p> <p>19 definition in that context. I go back to my previous</p> <p>20 answer.</p> <p>21 Q. Well, let's get rid of "broadly" for a</p> <p>22 second. When you say, "Throughput refers to an amount</p> <p>23 of information, per unit time, that can be transmitted</p> <p>24 through a communications network."</p> <p>25 MR. GALLUZZO: Objection to form.</p> <p style="text-align: right;">Page 52</p>
<p>1 as Dr. Chatterjee seems to agree, and sometimes it may</p> <p>2 not be.</p> <p>3 I'd point you to the previous statement.</p> <p>4 "Throughput, like latency, may be heavily or even</p> <p>5 exclusively a function of processing efficiency or</p> <p>6 lack thereof."</p> <p>7 Q. Well, do you agree with that?</p> <p>8 A. I agree that throughput, measured at a high</p> <p>9 level of packets and things like that, that may</p> <p>10 definitely be a result of these other things that</p> <p>11 Dr. Chatterjee mischaracterizes as being associated</p> <p>12 with the transport system.</p> <p>13 Q. Does throughput indicate the information</p> <p>14 carrying capacity of a channel?</p> <p>15 A. Again, you're using the term "throughput"</p> <p>16 generically. You have to define what throughput</p> <p>17 you're talking about.</p> <p>18 Q. Can throughput indicate the information</p> <p>19 carrying capacity of a channel?</p> <p>20 A. I would say that that question is too vague.</p> <p>21 I can't answer that "yes" or "no" unless I understand</p> <p>22 the context of throughput.</p> <p>23 Q. So you need to know the specifics of the</p> <p>24 particular throughput measurement to determine whether</p> <p>25 it's related to the information carrying capacity of a</p> <p style="text-align: right;">Page 51</p>	<p>1 Is there a question?</p> <p>2 BY MR. PADMANABHAN:</p> <p>3 Q. Using that definition, does throughput</p> <p>4 indicate the information carrying capacity of a</p> <p>5 channel?</p> <p>6 MR. GALLUZZO: Objection to form. Vague.</p> <p>7 THE WITNESS: I would refer you to Lines 15</p> <p>8 and 16 of my response. "As with latency, 'throughput'</p> <p>9 is a metric that involves many factors above and</p> <p>10 beyond signal quality."</p> <p>11 BY MR. PADMANABHAN:</p> <p>12 Q. Does throughput indicate the information</p> <p>13 carrying capacity of a channel?</p> <p>14 A. Again, my question is I'm addressing as</p> <p>15 Dr. Chatterjee uses the term, measuring the</p> <p>16 performance of the entire network.</p> <p>17 Q. How would a person of ordinary skill in the</p> <p>18 art know?</p> <p>19 A. A person of skill in the art would know the</p> <p>20 difference between throughput issues which are caused</p> <p>21 by routers, other things associated, and other parts</p> <p>22 of the DOCSIS system, the MAC layer versus the file</p> <p>23 layer. They would know the difference between packets</p> <p>24 and symbols and bits. All of these affect the</p> <p>25 throughput of the system but not what we're talking</p> <p style="text-align: right;">Page 53</p>

<p>1 about, the transport layer --</p> <p>2 BY MR. PADMANABHAN:</p> <p>3 Q. When you say the transmission --</p> <p>4 (Indiscernible crosstalk.)</p> <p>5 BY MR. PADMANABHAN:</p> <p>6 Q. When you're saying the transmission layer,</p> <p>7 you're referring to the DOCSIS layer or the MAC layer</p> <p>8 or the PHY layer?</p> <p>9 A. No. It's the PHY layer. The physical layer</p> <p>10 the transport network has defined in the patent and as</p> <p>11 any POSITA knows what that is.</p> <p>12 Q. Does the '682 patent in any place say that</p> <p>13 SNR related metric must be at the PHY layer?</p> <p>14 A. No. It says the transport layer, which is</p> <p>15 that PHY layer. PHY has symbols and bits. It doesn't</p> <p>16 have packets.</p> <p>17 Q. So I searched the '682 patent. It does not</p> <p>18 say the word "transport" anywhere. You'd agree with</p> <p>19 me; right?</p> <p>20 A. Yes. However, it clearly is shown in terms</p> <p>21 of the illustration.</p> <p>22 MR. PADMANABHAN: Why don't we take a</p> <p>23 two-minute break.</p> <p>24 MR. GALLUZZO: Can we take five instead of</p> <p>25 two?</p> <p style="text-align: right;">Page 54</p>	<p>1 is not necessarily a metric of the information</p> <p>2 carrying capacity of the physical channel," you're</p> <p>3 implying that latency sometimes is a metric for the</p> <p>4 information carrying capacity of the physical channel;</p> <p>5 correct?</p> <p>6 MR. GALLUZZO: Objection to form.</p> <p>7 THE WITNESS: Incorrect. My response on</p> <p>8 latency is the way that Dr. Chatterjee has defined</p> <p>9 latency, which is the waiting time or time delay for</p> <p>10 network communications.</p> <p>11 BY MR. PADMANABHAN:</p> <p>12 Q. So is it your opinion that latency is never a</p> <p>13 metric for the information carrying capacity of a</p> <p>14 physical channel?</p> <p>15 A. As Dr. Chatterjee has defined "latency" and</p> <p>16 my response is based on that, that's correct. His</p> <p>17 definition.</p> <p>18 (Pause.)</p> <p>19 BY MR. PADMANABHAN:</p> <p>20 Q. How about if there are not significant delays</p> <p>21 solely attributable to the end-point devices?</p> <p>22 MR. GALLUZZO: Objection to form. Vague.</p> <p>23 THE WITNESS: Well, again, you can have</p> <p>24 latency without an impact on throughput or on SNR.</p> <p>25 BY MR. PADMANABHAN:</p> <p style="text-align: right;">Page 56</p>
<p>1 MR. PADMANABHAN: Five would be fine, yeah.</p> <p>2 MR. GALLUZZO: Okay.</p> <p>3 (A recess was taken from 10:27 a.m.</p> <p>4 to 10:43 a.m.)</p> <p>5 BY MR. PADMANABHAN:</p> <p>6 Q. Mr. Holobinko, can we go to Paragraph 21 of</p> <p>7 your declaration.</p> <p>8 MR. GALLUZZO: Which one, KP?</p> <p>9 BY MR. PADMANABHAN:</p> <p>10 Q. Of your rebuttal declaration.</p> <p>11 A. Yes.</p> <p>12 Q. So this is Exhibit 3 to your deposition;</p> <p>13 right?</p> <p>14 A. Yes.</p> <p>15 Q. And in Paragraph 21 you say, "Latency is not</p> <p>16 necessarily a metric for the information carrying</p> <p>17 capacity of a physical channel."</p> <p>18 Do you see that?</p> <p>19 A. Yes.</p> <p>20 Q. So when you say that, you're indicating that</p> <p>21 sometimes latency is a metric for the information</p> <p>22 carrying capacity --</p> <p>23 (The Reporter requested clarification.)</p> <p>24 BY MR. PADMANABHAN:</p> <p>25 Q. In paragraph 21, when you say that "Latency</p> <p style="text-align: right;">Page 55</p>	<p>1 Q. So is that part of what's required to be an</p> <p>2 SNR related metric? You need to have an impact on</p> <p>3 SNR?</p> <p>4 A. It needs to have a correlation to SNR. It</p> <p>5 has to be an SNR related metric, and latency does not</p> <p>6 meet that criterion.</p> <p>7 Q. Okay. Let's go to your first declaration,</p> <p>8 which is Exhibit 2 to your deposition. And it's -- do</p> <p>9 you have it?</p> <p>10 A. Yes.</p> <p>11 Q. And let's go to "cable modem termination</p> <p>12 system (CMTS)" starting on Page 11. I just want to</p> <p>13 get there for your reference.</p> <p>14 Tell me when you're there.</p> <p>15 A. I am there.</p> <p>16 Q. Mr. Holobinko, would you agree that in 2012</p> <p>17 there were devices that were referred to as "CMTSes"?</p> <p>18 A. I'm sorry. Your audio broke up.</p> <p>19 Q. Sure.</p> <p>20 Well, let's start with this: The acronym</p> <p>21 "CMTS" stands for cable modem termination system;</p> <p>22 right?</p> <p>23 A. Yes.</p> <p>24 Q. Okay. And would you agree that in 2012 there</p> <p>25 were devices that were referred to as "CMTSes"?</p> <p style="text-align: right;">Page 57</p>

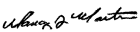
<p>1 A. There were systems that were referred to as 2 "CMTSes." 3 Q. Those systems had a physical piece of 4 hardware that you would call a "CMTS"; right? 5 A. They had multiple -- they could have multiple 6 pieces of hardware and software called a "CMTS." 7 Q. Was the RSC4 referenced as a CMTS? 8 A. The RSC4 is an integrated CMTS. It consists 9 of hardware -- 10 (Indiscernible crosstalk.) 11 THE WITNESS: Excuse me. Let me -- I paused, 12 so forgive me. 13 BY MR. PADMANABHAN: 14 Q. No, go ahead. 15 A. And it consists of hardware and software. 16 Q. The RSC4 is not a general purpose computer; 17 right? 18 A. That is correct, it is not a general purpose 19 computer. 20 Q. Another CMTS available in 2012 is the 21 Cisco uBER10012? 22 A. Yeah. Commonly referred to as a Cisco 10K in 23 short, for short. 24 Q. So we'll refer to it as such. 25 A. Yeah.</p> <p style="text-align: right;">Page 58</p>	<p>1 Q. -- that was not in products that were already 2 deployed in the marketplace; correct? 3 A. Correct. But I would add that -- 4 Q. So, Mr. Holobinko, I'd like you to answer the 5 question I'm asking -- 6 MR. GALLUZZO: Hold on a second. You just 7 interrupted him in the middle of his answer. 8 Mr. Holobinko, please finish your answer. 9 MR. PADMANABHAN: No. No. I'll ask -- 10 MR. GALLUZZO: No. No. You stopped him -- 11 you stopped him from answering a question. Please let 12 him finish answering the question. 13 MR. PADMANABHAN: We're going to have a messy 14 record. I'm just going to re-ask my question, and you 15 can provide your answer, Mr. Holobinko. 16 MR. GALLUZZO: KP, I understand what you're 17 trying to do. Please let him finish answering his 18 question. If you'd like to re-ask it, you can after 19 that. 20 MR. PADMANABHAN: Go ahead. Say what you're 21 going to say. 22 For the record, I'd like to say that you 23 basically cannot interrupt the questioning. So I'll 24 let it go this time, but we're not going to do it 25 again.</p> <p style="text-align: right;">Page 60</p>
<p>1 Q. Uber 10k or just 10k? 2 A. Just 10k is fine. 3 Q. Okay. And so the Cisco 10k was also a piece 4 of hardware; correct? 5 A. It was a piece of hardware and software. It 6 had an operating system, a processing capability. 7 Q. Was -- the Cisco 10k was not a general 8 purpose computer; right? 9 A. Was not a general purpose computer, that is 10 correct. 11 Q. You don't cite anything in your declaration 12 stating that a general purpose computer could be a 13 CMTS in 2012, do you? 14 A. I do not, but a POSITA would know that by 15 2012 that the ability to do many of the functions of a 16 CMTS were being looked at being done on the general 17 computer. 18 Q. You don't cite any documents in support of 19 that proposition; correct? 20 A. No, I don't. But as a POSITA and as the head 21 of business strategy at Motorola, I actually was part 22 of an effort that did the early work on that. 23 Q. So that's the early work. That was 24 development work -- 25 A. Yes.</p> <p style="text-align: right;">Page 59</p>	<p>1 Q. Go ahead, Mr. Holobinko. 2 A. As early as 2001, people defined 3 disaggregation of the CMTS and the use -- the 4 potential use of general purpose machines and the 5 disaggregation was memorialized in -- initially in 6 2005 with modular CMTS. 7 Q. You do not cite any documents in either of 8 your two declarations regarding the supposed 9 disaggregation of the CMTS; correct? 10 A. That is -- I'm not sure. So on the premise 11 that I didn't cite them, Dr. Chatterjee cited Cisco 12 and John Chapman, and John Chapman was the person who 13 invented that while he was the chief architect for 14 CMTS at Cisco Systems starting in 2001. 15 Q. When you say he "invented that," what do you 16 say that he invented? 17 A. Modular CMTS. 18 Q. Modular CMTSes were devices in which 19 something called an edge QAM would sit outside of the 20 housing of a CMTS; right? 21 A. Partially correct. That's one of the devices 22 that could sit outside. 23 Q. You do not cite any documents related to any 24 disaggregation of CMTSes in your declarations; 25 correct?</p> <p style="text-align: right;">Page 61</p>

<p>1 A. Correct.</p> <p>2 Q. Now, you reference "functions." What</p> <p>3 functions would a device need to have in order to be</p> <p>4 considered a CMTS? Actually, strike that. Strike my</p> <p>5 question.</p> <p>6 In your declaration you do not identify any</p> <p>7 functions that a computer would need to have in order</p> <p>8 to qualify as a CMTS; correct?</p> <p>9 A. Correct.</p> <p>10 (Pause.)</p> <p>11 BY MR. PADMANABHAN:</p> <p>12 Q. I want you to put yourself back in 2012.</p> <p>13 Can you do that for me?</p> <p>14 A. Okay.</p> <p>15 Q. A cable modem transmitting upstream would</p> <p>16 have hardware in the headend at which the data would</p> <p>17 terminate; correct?</p> <p>18 A. Correct.</p> <p>19 Q. In 2012 the hardware at which the data would</p> <p>20 terminate in the cable headend was called a CMTS;</p> <p>21 correct?</p> <p>22 A. Incorrect.</p> <p>23 Q. What was it called?</p> <p>24 A. It was called the burst receiver within the</p> <p>25 PHY layer of the CMTS. It was not called a CMTS.</p> <p style="text-align: right;">Page 62</p>	<p>1 A. As long as you could do the fiberoptic back</p> <p>2 to do the burst receiver, you could put the QAM</p> <p>3 somewhere else. It wasn't a requirement.</p> <p>4 Q. Are there any other -- so there's a</p> <p>5 modulator -- right? -- which can sit outside of -- in</p> <p>6 the modular CMTS architecture, it can sit outside of</p> <p>7 the CMTS housing; correct?</p> <p>8 A. Yes.</p> <p>9 Q. In 2012 are there any other physical</p> <p>10 components you'd say are part of the CMTS besides the</p> <p>11 CMTS chassis and the modulator?</p> <p>12 A. Well, if we call the CMTS a system, I have a</p> <p>13 clock that's generated outside of that chassis. I</p> <p>14 have systems for doing subscriber management that are</p> <p>15 programed into the CMTS that are outside of that. And</p> <p>16 by 2012, the view of the disaggregation of the CMTS</p> <p>17 was widely discussed and being presented in papers as</p> <p>18 far back as 2007. And so a POSITA would understand</p> <p>19 that a CMTS does not necessarily have to be a single</p> <p>20 box.</p> <p>21 Q. Is every system that's responsible with</p> <p>22 managing a piece of hardware part of that hardware?</p> <p>23 MR. GALLUZZO: Objection to form. Vague.</p> <p>24 THE WITNESS: So you're using the term</p> <p>25 "managing a piece of hardware." What are you</p> <p style="text-align: right;">Page 64</p>
<p>1 I'll refer back to my original answer, which</p> <p>2 is that CMTS is a multi-function system of which</p> <p>3 you've just described one function.</p> <p>4 Q. The burst receiver was a component that sat</p> <p>5 within a CMTS; correct?</p> <p>6 A. Yes.</p> <p>7 Q. Okay. So CMTS is -- it's a rack server</p> <p>8 device; right?</p> <p>9 A. Again, if we take your argument that the</p> <p>10 burst receiver sits in the CMTS, then by the same</p> <p>11 token, the modulator, which was initially part of the</p> <p>12 CMTS, was routinely separated from the CMTS at that</p> <p>13 time in a modular CMTS architecture, and by that time,</p> <p>14 people understood the further disaggregation was</p> <p>15 desired.</p> <p>16 Q. The modulator also sat in the cable</p> <p>17 headend -- correct? -- in 2012?</p> <p>18 A. No, not necessarily. The modulator could be</p> <p>19 further away.</p> <p>20 Q. In 2012?</p> <p>21 A. In 2012. I owned a product line of QAM</p> <p>22 modulators.</p> <p>23 Q. Okay. And where would they sit?</p> <p>24 A. They could sit in another hub.</p> <p>25 Q. Okay.</p> <p style="text-align: right;">Page 63</p>	<p>1 referring to as a "piece of hardware" because the CMTS</p> <p>2 is hardware and software.</p> <p>3 BY MR. PADMANABHAN:</p> <p>4 Q. I'm not trying to take away the software off</p> <p>5 the CMTS.</p> <p>6 A. Okay.</p> <p>7 Q. So I'm talking there's a physical device</p> <p>8 called a "CMTS" and a cable headend in 2012.</p> <p>9 Are you with me?</p> <p>10 A. Yes. In one form. An integrated CMTS is</p> <p>11 what you're referring to.</p> <p>12 Q. Okay. Let's say it's a modular CMTS, so</p> <p>13 the --</p> <p>14 A. Okay.</p> <p>15 Q. -- resides also in the cable headend.</p> <p>16 Are you with me?</p> <p>17 A. Okay. Okay, yes.</p> <p>18 Q. Is every system that's responsible for</p> <p>19 providing data to that CMTS located in the headend</p> <p>20 also part of the CMTS, in your opinion?</p> <p>21 A. Is every system responsible for providing</p> <p>22 data to that CMTS a part of the CMTS.</p> <p>23 What do you mean by "data"?</p> <p>24 Q. Well, I asked my question. Do you have an</p> <p>25 answer?</p> <p style="text-align: right;">Page 65</p>

<p>1 A. Well, data in your context could be the 2 traffic that's being delivered to the cable modems. 3 It could be programming language. Data is too generic 4 a form. I don't know what your question is. 5 Q. Is every system that's responsible for, for 6 example, providing the list of subscribers that are 7 going to be handled by that CMTS, part of that CMTS? 8 MR. GALLUZZO: Objection to form. Vague. 9 THE WITNESS: The CMTS specification doesn't 10 say whether it is or isn't. It's a matter of 11 implementation. 12 BY MR. PADMANABHAN: 13 Q. When you say, "the CMTS specification," what 14 are you referencing? 15 A. The DOCSIS specification. 16 Q. Would you say the DOCSIS specification 17 defines what a CMTS is? 18 A. In terms of its minimum functions, yes. In 19 terms of its form, no. That's why different CMTSes 20 are built differently. 21 MR. PADMANABHAN: Mr. Holobinko, I'm going 22 to -- give me a moment. 23 (Pause in proceedings.) 24 MR. PADMANABHAN: So I'd like you to turn to 25 Tab 10 of your binder, which I've marked as Exhibit 4</p> <p style="text-align: right;">Page 66</p>	<p>1 Do you see that? 2 A. Yes. 3 Q. And in that image, that's what you're 4 referencing as the CMTS, that chassis; correct? 5 MR. GALLUZZO: Objection to form. 6 THE WITNESS: That is -- my intent there was 7 a -- was to represent the functions of a CMTS system, 8 not to define by bounds what a CMTS is. 9 BY MR. PADMANABHAN: 10 Q. No matter. I just want to understand. 11 A. Yeah. So I'll agree that -- 12 MR. GALLUZZO: Hold on. 13 THE WITNESS: Sorry. 14 BY MR. PADMANABHAN: 15 Q. Is that chassis a CMTS? 16 A. No. The chassis and software and you can't 17 tell from this example if the edge QAMs are also part 18 of the CMTS function. 19 Q. Okay. So it could be chassis with software 20 and edge QAMs; correct? 21 MR. GALLUZZO: Objection to form. 22 BY MR. PADMANABHAN: 23 Q. You can answer, Mr. Holobinko. 24 A. The functions of the CMTS would be at least 25 with those devices.</p> <p style="text-align: right;">Page 68</p>
<p>1 to your deposition. 2 (Pause.) 3 THE WITNESS: Yes. 4 (Deposition Exhibit 4 was marked for 5 identification.) 6 MR. PADMANABHAN: And Exhibit 4 to your 7 deposition is a presentation, a "CABLE-TECH Expo 8 2013." 9 Q. Do you see that? 10 A. Yes. 11 Q. And it lists one dashing John Holobinko as 12 its author. 13 Do you see that? 14 A. I see that very well, and I agree with you. 15 Q. Okay. And if you go to the eighth slide, 16 it's entitled "Example System Functional 17 Characteristics," work piece of paper. 18 A. What is the header? 19 Q. "Example System Functional Characteristics." 20 A. Yes. 21 Q. And it says, "CMTS and DOCSIS CPE MIBS." 22 Do you see that? 23 A. Uh-huh. 24 Q. And you've got something circled there, and 25 it shows a chassis.</p> <p style="text-align: right;">Page 67</p>	<p>1 MR. PADMANABHAN: Okay. Let's go to 2 Exhibit 5, which is behind Tab 11 in your binder. 3 (Deposition Exhibit 5 was marked for 4 identification.) 5 MR. PADMANABHAN: And this appears to be a 6 paper associated with the presentation that we looked 7 at. 8 Q. Do you see that? 9 A. I'm sorry. Tab 5, I see a patent. 10 Q. No. It's Tab 11. Exhibit 5. It says, 11 "Tab 11" in your binder. You're fine. 12 A. Tab 11. 13 MR. PADMANABHAN: So Tab 11, for the record, 14 is Exhibit 5 to the deposition, and it's a 15 presentation entitled "New Analytic Methods For 16 Determining Network Performance Issues" with an 17 Expo 2013 date, and it lists John Holobinko as an 18 author, amongst others. 19 Q. Do you see that? 20 A. Yes. 21 Q. And this is the paper that goes along with 22 the presentation we looked at as Exhibit 4; correct? 23 A. Yes. 24 Q. Okay. And so if you go to the second to the 25 last page, there's a bibliography.</p> <p style="text-align: right;">Page 69</p>

<p>1 A. Yes.</p> <p>2 Q. And it says there, "'proactive Network</p> <p>3 Maintenance Using Pre-equalization' DOCSIS."</p> <p>4 Do you see that?</p> <p>5 A. No. Forgive me. Abbreviations and acronyms?</p> <p>6 Q. No. Previous page says, "Bibliography."</p> <p>7 A. Oh. Thank you.</p> <p>8 Q. Do you see that, "'Proactive'" --</p> <p>9 A. Yes.</p> <p>10 Q. -- "'Network Maintenance Using</p> <p>11 Pre-equalization'"?</p> <p>12 A. Yes.</p> <p>13 Q. And that's a DOCSIS specification document;</p> <p>14 right?</p> <p>15 A. Uh-huh. Yes.</p> <p>16 (Deposition Exhibit 6 was marked for</p> <p>17 identification.)</p> <p>18 MR. PADMANABHAN: So if you turn to Tab 12,</p> <p>19 we have that DOCSIS specification document regarding</p> <p>20 proactive network maintenance using</p> <p>21 pre-equalization --</p> <p>22 THE WITNESS: Uh-huh.</p> <p>23 MR. PADMANABHAN: -- and that is Exhibit 6 to</p> <p>24 your deposition.</p> <p>25 And if you turn to Page 3, there's a</p> <p style="text-align: right;">Page 70</p>	<p>1 form.</p> <p>2 Q. Okay. Let me ask you a couple of examples</p> <p>3 just so I understand your opinions. I want you to</p> <p>4 think about when you're at home and you're logging</p> <p>5 onto your Apple TV device to watch your favorite</p> <p>6 streaming program. Let's say it's a Netflix program.</p> <p>7 Are you with me?</p> <p>8 A. Yes.</p> <p>9 Q. Okay. You go into the log-in screen for</p> <p>10 Netflix, and you need to enter a user name and</p> <p>11 password.</p> <p>12 Are you with me?</p> <p>13 A. I'm with you.</p> <p>14 Q. And you put the user name and password in,</p> <p>15 and that's going to be authenticated by some back-end</p> <p>16 server; correct?</p> <p>17 A. Could be.</p> <p>18 Q. Let's assume it is.</p> <p>19 MR. GALLUZZO: Counsel, I believe we are out</p> <p>20 of time.</p> <p>21 MR. PADMANABHAN: Okay. That's fine.</p> <p>22 Thank you very much. Appreciate it.</p> <p>23 Mr. Holobinko. Thank you for your time.</p> <p>24 THE WITNESS: Thank you.</p> <p>25 MR. PADMANABHAN: We are appreciative.</p> <p style="text-align: right;">Page 72</p>
<p>1 definition of cable modem termination system.</p> <p>2 Q. Do you see that?</p> <p>3 A. Yes.</p> <p>4 Q. And it says, "A device located at the cable</p> <p>5 television system headend or distribution hub."</p> <p>6 Do you see that?</p> <p>7 A. Yes.</p> <p>8 Q. Do you disagree with that definition?</p> <p>9 A. Yes. And a POSITA would understand that</p> <p>10 that's a generic term.</p> <p>11 Q. But when you refer to the DOCSIS</p> <p>12 specification, this is amongst the documents you're</p> <p>13 referencing; correct?</p> <p>14 A. No. I'm referring to the DOCSIS</p> <p>15 specification as in DOCSIS 2.0, DOCSIS 3.0, DOCSIS 3.1</p> <p>16 that defines the DOCSIS system --</p> <p>17 (Indiscernible crosstalk.)</p> <p>18 THE WITNESS: -- as opposed to a proactive</p> <p>19 network maintenance system specification.</p> <p>20 BY MR. PADMANABHAN:</p> <p>21 Q. Do you know if those specifications define a</p> <p>22 cable modem termination system in any way different</p> <p>23 than the document that's Exhibit 6 to your deposition?</p> <p>24 A. As I stated previously, they don't define.</p> <p>25 They define the functions. They don't define the</p> <p style="text-align: right;">Page 71</p>	<p>1 MR. GALLUZZO: I have some short redirect,</p> <p>2 but I'd like to take a break, please.</p> <p>3 MR. PADMANABHAN: Sure.</p> <p>4 (A recess was taken from 11:12 a.m.</p> <p>5 to 11:17 a.m.)</p> <p>6</p> <p>7 EXAMINATION</p> <p>8 BY MR. GALLUZZO:</p> <p>9 Q. Mr. Holobinko, thank you. Just a short</p> <p>10 redirect here.</p> <p>11 Do you recall your earlier testimony when</p> <p>12 defense counsel was asking you about SNR related</p> <p>13 metrics and you referred to them as being a</p> <p>14 "substitute for SNR"?</p> <p>15 A. Yes.</p> <p>16 Q. Explain what you meant when you said</p> <p>17 substitute for SNR.</p> <p>18 MR. PADMANABHAN: Objection. Form.</p> <p>19 BY MR. GALLUZZO:</p> <p>20 Q. Is that concept described in either --</p> <p>21 MR. PADMANABHAN: Hold on. I think there's a</p> <p>22 delay or something.</p> <p>23 REPORTER MARTIN: I didn't hear the answer.</p> <p>24 MR. PADMANABHAN: Yeah, I didn't hear an</p> <p>25 answer. I definitely heard an objection.</p> <p style="text-align: right;">Page 73</p>

<p>1 MR. GALLUZZO: I'll re-ask. I don't see a 2 delay now, but if you guys get a delay, we can try a 3 different means. 4 MR. PADMANABHAN: So, Mr. Holobinko, just as 5 your counsel had a right to object, we also have a 6 right to object to any questions that your counsel 7 asks. So I would ask that you give us the same 8 courtesy and take a moment before you answer. 9 Can you do that for me? 10 THE WITNESS: Yes. 11 MR. GALLUZZO: Are you getting a delay now? 12 He did pause earlier. 13 MR. PADMANABHAN: We definitely did not hear 14 a pause. I objected immediately. So why don't you 15 re-ask. But I objected, for the record, to the 16 previous question. 17 MR. GALLUZZO: When I ask questions, wait 18 extra long because I think we have a delay. 19 Q. So, Mr. Holobinko, do you recall earlier 20 testimony when counsel for the defendants was asking 21 you about SNR related metrics and you had discussed 22 the concept of a substitute for SNR? 23 A. Yes. 24 Q. What did you mean when you were describing a 25 substitute for SNR?</p> <p style="text-align: right;">Page 74</p>	<p>1 Q. Where? 2 A. Through reference -- if I... 3 (The witness reviewed material.) 4 THE WITNESS: I'm sorry. It is either -- if 5 it's not in the patent, it's in the patents that are 6 referred to as part of the claim. I have to look for 7 a moment. 8 (The witness further reviewed material.) 9 BY MR. GALLUZZO: 10 Q. Mr. Holobinko, I'll withdraw the question. 11 Could you please turn to Paragraph 15 of your 12 rebuttal declaration. 13 (Pause.) 14 BY MR. GALLUZZO: 15 Q. Are you there? 16 A. Yes. 17 Q. At the top of Page 5, is this the application 18 you were referring to? 19 A. Yes. 20 Q. Is bit error rate listed there? 21 A. It is. 22 Q. I'd like to move on to throughput. There was 23 quite a bit of testimony about this. 24 Do you recall that? 25 A. Yes.</p> <p style="text-align: right;">Page 76</p>
<p>1 MR. PADMANABHAN: Objection. Form. 2 THE WITNESS: I meant an equivalency. 3 BY MR. GALLUZZO: 4 Q. Is that concept described in either of your 5 declarations? 6 A. Yes. 7 Q. Make sure you please give a moment for -- 8 A. Oh, I'm so sorry. 9 Q. -- objections. 10 MR. PADMANABHAN: I will object to form. 11 Go ahead. 12 BY MR. GALLUZZO: 13 Q. Do you recall testimony where defense counsel 14 was asking you about various examples of SNR related 15 metrics? 16 A. Yes. 17 Q. BER was one of those metrics you were 18 discussing? 19 A. Yes. 20 Q. Is BER, bit error rate, an SNR related 21 metric? 22 A. Yes. 23 Q. Are you 100 percent sure of that? 24 A. It is -- yes. It is referred to directly in 25 the patent.</p> <p style="text-align: right;">Page 75</p>	<p>1 Q. Are there different ways of measuring 2 throughput? 3 A. Absolutely. 4 MR. PADMANABHAN: Mr. Holobinko, you got to 5 give me a second. 6 MR. GALLUZZO: Yeah, let's give it a three 7 count between questions. 8 MR. PADMANABHAN: Objection. Form. 9 BY MR. GALLUZZO: 10 Q. Is it possible to measure throughput at the 11 network layer or the MAC layer? 12 A. Yes. 13 MR. PADMANABHAN: Objection. Form. 14 BY MR. GALLUZZO: 15 Q. What are you measuring the throughput of at 16 that layer? 17 MR. PADMANABHAN: Objection. Form. 18 THE WITNESS: At the MAC layer, you're 19 measuring the throughput end to end of packets, not of 20 bits, not of symbols. 21 BY MR. GALLUZZO: 22 Q. At that layer is throughput an SNR related 23 metric? 24 A. No. 25 Q. Make sure to give your three count.</p> <p style="text-align: right;">Page 77</p>

<p>1 MR. GALLUZZO: Did you have an objection, 2 Counsel? 3 MR. PADMANABHAN: No. 4 MR. GALLUZZO: All right. No further 5 questions. 6 MR. PADMANABHAN: We don't have any further 7 redirect. We'll save our questions for the Markman 8 hearing. 9 (Witness excused.) 10 (Deposition concluded at 11:25 a.m.) 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</p> <p style="text-align: right;">Page 78</p>	<p>1 INSTRUCTIONS TO WITNESS 2 3 Please read your deposition over carefully 4 and make any necessary corrections. You should state 5 the reason in the appropriate space on the errata 6 sheet for any corrections that are made. 7 After doing so, please sign the errata sheet 8 and date it. You are signing same subject to the 9 changes you have noted on the errata sheet, which will 10 be attached to your deposition. It is imperative that 11 you return the original errata sheet to the deposing 12 attorney within thirty (30) days of receipt of the 13 deposition transcript by you. If you fail to do so, 14 the deposition transcript may be deemed to be accurate 15 and may be used in court. 16 17 18 19 20 21 22 23 24 25</p> <p style="text-align: right;">Page 80</p>
<p>1 CERTIFICATE 2 I do hereby certify that the aforesaid testimony 3 was taken before me, pursuant to notice, at the time 4 and place indicated; that said deponent was by me duly 5 sworn to tell the truth, the whole truth, and nothing 6 but the truth; that the testimony of said deponent was 7 correctly recorded in machine shorthand by me and 8 thereafter transcribed under my supervision with 9 computer-aided transcription; that the deposition is a 10 true and correct record of the testimony given by the 11 witness; and that I am neither of counsel nor kin to 12 any party in said action, nor interested in the 13 outcome thereof. 14 15  Nancy J. Martin, RMR, CSR 16 17 Dated: May 14, 2024 18 19 20 21 (The foregoing certification of this transcript does 22 not apply to any reproduction of the same by any 23 means, unless under the direct control and/or 24 supervision of the certifying shorthand reporter.) 25</p> <p style="text-align: right;">Page 79</p>	<p>1 ----- 2 ERRATA 3 ----- 4 PAGE LINE CHANGE 5 _____ 6 _____ 7 _____ 8 _____ 9 _____ 10 _____ 11 _____ 12 _____ 13 _____ 14 _____ 15 _____ 16 _____ 17 _____ 18 _____ 19 _____ 20 _____ 21 _____ 22 _____ 23 _____ 24 _____ 25 _____</p> <p style="text-align: right;">Page 81</p>

<div>1 ACKNOWLEDGMENT OF DEPONENT</div> <div>2</div> <div>3 I, JOHN HOLOBINKO, do hereby certify that I</div> <div>4 have read the foregoing pages, _____ to _____,</div> <div>5 and that the same is a correct transcription of the</div> <div>6 answers given by me to the questions therein</div> <div>7 propounded, except for the corrections or changes in</div> <div>8 form or substance, if any, noted in the attached</div> <div>9 Errata Sheet.</div> <div>10</div> <div>11 _____</div> <div>12 DATE SIGNATURE</div> <div>13</div> <div>14</div> <div>15</div> <div>16 Subscribed and sworn to before me this _____ day</div> <div>17 of _____, 20__.</div> <div>18</div> <div>19</div> <div>20 My commission expires: _____.</div> <div>21</div> <div>22 _____</div> <div>23 Notary Public</div> <div>24</div> <div>25</div> <div>Page 82</div>	<div>1 _X_ Federal R&S Requested (FRCP 30(e)(1)(B)) – Locked .PDF</div> <div>2 Transcript - The witness should review the transcript and</div> <div>3 make any necessary corrections on the errata pages included</div> <div>4 below, notating the page and line number of the corrections.</div> <div>5 The witness should then sign and date the errata and penalty</div> <div>6 of perjury pages and return the completed pages to all</div> <div>7 appearing counsel within the period of time determined at</div> <div>8 the deposition or provided by the Federal Rules.</div> <div>9 __ Federal R&S Not Requested - Reading & Signature was not</div> <div>10 requested before the completion of the deposition.</div> <div>11</div> <div>12</div> <div>13</div> <div>14</div> <div>15</div> <div>16</div> <div>17</div> <div>18</div> <div>19</div> <div>20</div> <div>21</div> <div>22</div> <div>23</div> <div>24</div> <div>25</div> <div>Page 84</div>
<div>1 VINCENT GALLUZZO, ESQ.</div> <div>2 vincent.galluzzo@klgates.com</div> <div>3 May 14, 2024</div> <div>4 RE: ENTROPIC COMMUNICATIONS, LLP vs. COX COMMUNICATIONS, INC.</div> <div>5 MAY 9, 2024-JOHN HOLOBINKO-JOB NO.6690893</div> <div>6 The above-referenced transcript has been</div> <div>7 completed by Veritext Legal Solutions and</div> <div>8 review of the transcript is being handled as follows:</div> <div>9 __ Per CA State Code (CCP 2025.520 (a)-(e)) – Contact Veritext</div> <div>10 to schedule a time to review the original transcript at</div> <div>11 a Veritext office.</div> <div>12 __ Per CA State Code (CCP 2025.520 (a)-(e)) – Locked .PDF</div> <div>13 Transcript - The witness should review the transcript and</div> <div>14 make any necessary corrections on the errata pages included</div> <div>15 below, notating the page and line number of the corrections.</div> <div>16 The witness should then sign and date the errata and penalty</div> <div>17 of perjury pages and return the completed pages to all</div> <div>18 appearing counsel within the period of time determined at</div> <div>19 the deposition or provided by the Code of Civil Procedure.</div> <div>20 Contact Veritext when the sealed original is required.</div> <div>21 __ Waiving the CA Code of Civil Procedure per Stipulation of</div> <div>22 Counsel - Original transcript to be released for signature</div> <div>23 as determined at the deposition.</div> <div>24 __ Signature Waived – Reading & Signature was waived at the</div> <div>25 time of the deposition.</div> <div>Page 83</div>	<div>1 ENTROPIC COMMUNICATIONS, LLP vs. COX COMMUNICATIONS, INC.</div> <div>2 JOHN HOLOBINKO-JOB NO.6690893</div> <div>3 ERRATA SHEET</div> <div>4 PAGE____ LINE____ CHANGE_____</div> <div>5 _____</div> <div>6 REASON_____</div> <div>7 PAGE____ LINE____ CHANGE_____</div> <div>8 _____</div> <div>9 REASON_____</div> <div>10 PAGE____ LINE____ CHANGE_____</div> <div>11 _____</div> <div>12 REASON_____</div> <div>13 PAGE____ LINE____ CHANGE_____</div> <div>14 _____</div> <div>15 REASON_____</div> <div>16 PAGE____ LINE____ CHANGE_____</div> <div>17 _____</div> <div>18 REASON_____</div> <div>19 PAGE____ LINE____ CHANGE_____</div> <div>20 _____</div> <div>21 REASON_____</div> <div>22</div> <div>23 _____</div> <div>24 WITNESS Date</div> <div>25</div> <div>Page 85</div>

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

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THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS

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Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

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